7. (New) A method comprising:

improving the surface of graphite comprising;

dissolving amorphous carbon in an organic solvent to produce a solution,

mixing crystalline graphite particles in the solution,

refluxing the solution,

filtering the solution to obtain a powder, and

heat treating the powder at approximately 1000°C to obtain an active material wherein the active material comprises;

at least one crystalline graphite core evenly coated by an amorphous carbon shell,

the amorphous carbon shell coating the crystalline graphite core allowing the material to display at least two exothermic peaks when differential thermal analysis is conducted.

REMARKS

In response to the above-mentioned Office Action, Applicants amend the application and seek reconsideration thereof. In this response, no claims have been canceled, and one claim has been added. Accordingly, Claims 1-7 are pending.

Claims rejected under 35 U.S.C. §112

The Examiner rejected Claims 1-6 under 35 U.S.C. §112 first paragraph as based on a disclosure which is not enabling. The Examiner stated, "details of the carbon, critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure." The Applicants disagree.

Amended independent Claim 1 includes the details of,

"comprising: at least one crystalline graphite core; and an amorphous carbon

shell coating the crystalline graphite core;" This detail describes the structure of the carbonaceous material claimed as the invention. The Applicants respectfully submit that amended independent Claim 1 clearly patentably defines the invention, and request withdrawal of the rejection.

Dependent Claims 2-6 contain within them all the limitations of amended independent Claim 1. As amended independent Claim 1 is now patentable, the Applicants respectfully request the rejection of dependent Claims 2-6 as being based on a disclosure that is not enabling also be withdrawn.

The Examiner rejected Claims 1-6 under 35 U.S.C. §112 second paragraph as being incomplete for omitting essential elements, i.e. the experimental parameters of the measurements. The Examiner stated, "When doing a differential thermal analysis measurement of the materials, essential experimental parameters must be included to understand the relationship of the results to the materials studied." The Examiner further stated, "while not exhaustive of the necessary elements, one example is the atmosphere of the equipment." The Applicants respectfully disagree.

The carbonaceous active material of amended independent Claim 1, is defined with a core-shell structure and has definite relations between essential elements. Furthermore, there are no significant differences in shapes and positions of peaks of a differential thermal analysis (DTA) even though temperature, atmosphere and increment rate of temperature are varied. That is to say, the carbonaceous active material of the invention has at least two exothermic peaks overlapping to form shoulders at a temperature of from 500°C to 1000°C, regardless of the experimental parameters of a DTA. Therefore, it is not necessary that the experimental parameters of a DTA be described in the

claims. The Applicants respectfully request the rejection under 35 U.S.C. §112 second paragraph be withdrawn.

Claims rejected under 35 U.S.C. §102

The Examiner rejected Claims 1-6 under 35 U.S.C. §102(b) as being anticipated by Takami U.S. Patent 5,244,757 (Takami). The Examiner stated, "Takami (5,244,757) teaches a lithium secondary battery which comprises spherical particles. The particles have a graphite structural part and an amorphous type part (see Fig. 2). The carbonaceous material has an exothermic peak of 900°C or less by differential thermal analysis (col. 5, lines 15-30). No peaks are described for each material, however, the materials would have two, separate inherent values based on the graphite material and the non-graphite material. Thus the claims are anticipated." The Applicants respectfully submit that amended independent Claim 1 overcomes this rejection.

In order to anticipate a claim, the relied upon reference must disclose every limitation of the claim. The Takami reference and the invention have different technical features with regard to structures of carbonaceous active materials, preparing methods, and shapes of exothermic peaks in DTA. Among other limitations, the invention has as structure, a crystalline graphite core coated by an amorphous carbon shell. Takami fails to teach or suggest this limitation.

In Takami, the carbonaceous material has a graphite-like layer structure, or a graphoid layer structure part, and a turbulence-layered structure part. The layered structure is more disordered than graphite (see col. 3, lines 25-30). The graphite-like layered structure of the carbonaceous material is generally referred to as a "graphen sheet" in this art which does not have a complete crystalline structure. The turbulence-layered structure is more disordered than the

graphite-like layered structure. Therefore, the carbonaceous material of Takami is not crystalline graphite but an amorphous carbon. On the other hand, the carbonaceous material of this invention has a crystalline graphite core evenly coated with an amorphous carbon shell.

The carbonaceous material of Takami is made by carbonizing (for example at 600°C to 1500°C) or graphitization (for example above 1500°C) a mesophase small spherical particle or a mesophase pitch fiber (see col. 5, line 31 through col. 6, line 14). In the preferred embodiments of Takami the carbonaceous materials are made by heat-treatment at 1600°C or less and thus the obtained material is not crystalline graphite but amorphous carbon. On the contrary, the carbonaceous material of this invention is made by coating a crystalline graphite core with an amorphous carbon.

Additionally, the carbonaceous material of Takami has an exothermic peak value of 900°C or less in the differential thermal analysis. Preferably, the exothermic peak value is in the range of 600°C to 800°C (see col. 5, lines 20-30). However, the carbonaceous material has a single exothermic peak below a temperature of 800°C, mostly at 600°C to 700°C (see tables 1-7), because the material is amorphous carbon. On the other hand, the carbonaceous material of this invention has at least two overlapping exothermic peaks that form shoulders. The exothermic peaks of the amorphous carbon and the crystalline graphite are not separated, but overlap to form shoulders (see exothermic level of **Figure 1**).

Takami does not teach or suggest a crystalline graphite structure nor DTA peaks that overlap, but rather a disordered graphoid layer and a single DTA peak. Thus Takami cannot anticipate amended independent Claim 1 and its

dependent claims. Accordingly Applicants respectfully request that the rejection of Claims 1-6 under 35 U.S.C. §102(b) as being anticipated by Takami, be withdrawn.

CONCLUSION

Inasmuch as Applicant has so amended the claims, it is submitted that the claims pending for examination are now in condition for allowance, which early action is requested.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on January 4, 2001

Azar Burnham January 4, 2001